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A LOCK ON THE WELLAND CANAL

WATERWAYS OF AMERICA

BY ALEXANDER HUME FORD

EXACTLY a century and a quarter ago, George Washington, to demonstrate the possibility of his oft-urged plan for an inland waterway connecting the Atlantic Ocean with the Ohio River, and possibly the Great Lakes, set out from Jamestown on horseback to make a preliminary survey of the proposed canal along the banks of the Potomac and across the Alleghanies. So great was the confidence of the Virginians in Mr. Washington, who was then best known as the father of the canal system of the colonies, that in December, 1775, they at once subscribed the money which he reported would be necessary to build the canal. Unfortunately, however, Mr. Washington never lived to see the completion of his plans, although the Federal government is still at work upon them in a modified form.

Events transpired in 1776 which for many years diverted all of Mr. Washington's energies into other even more important channels, so that while his name continued to appear as a director in several of America's most important canal projects, he was unable, with his multiplicity of duties, to give that active personal direction to the construction of inter-State waterways which he always so ardently desired. However, in 1792 Mr. Washington did secure the charter for, and became the first president of, what was afterwards the Erie Canal; so that in both North and South it was Washington's brain that conceived the plan of an inter-State canal system to bind the colonies more closely together, in spite of England's oft-expressed disapproval of such an undertaking, on the ground that it would tend to unite the colonies against the mother-country.

More than a quarter of a century after Washington's startling proposition to unite the waters of the Great Lakes with those of the Atlantic, James Madison urged upon his fellow-statesmen the great need of a ship-canal from the waters of the Mississippi to those of Lake Michigan, through which light-draught war-vessels could pass into the great inland

SAULT STE. MARIE—THE CANAL

seas to protect, in time of war, the numerous settlements springing up on the shores of the western lakes. This suggestion will yet be carried out by the Federal government on a grander scale than Mr. Madison ever conceived. The Chicago Drainage Canal, twenty-two feet deep, is now completed for a distance of forty miles.

In 1824, John C. Calhoun, then Secretary of War, personally supervised the survey of the extension of the Chesapeake and Ohio Canal to Pittsburg, which was first advocated by Washington. It was Mr. Calhoun's fond hope to see this canal carried on to Lake Erie, and under his direction estimates were made for the entire distance from Georgetown to Ashtabula. The engineers reported that there was sufficient water even at the summit amply to supply a canal ten feet deep in the driest summers; but the total cost of the undertaking staggered Congress, so that the effort to make Baltimore the metropolis of America, in place of New York, came to naught.

The construction of the Manchester ship-canal in England, and other great inland waterways in the Old World, built for the sole purpose of making seaports of inland cities, has taught the keen-eyed, cautious Yankee a lesson, so that to-day almost every great city of the North is deluging Congress with memorials pleading for ship-canal connections. Even far down South, and away out West, the people are beginning to catch the fever. Philadelphia urges upon the government at Washington the necessity of a twenty-seven-foot channel across the State of New Jersey, connecting the Quaker City with New York Harbor; Baltimore demands a similar depth across Delaware; Pittsburg is doing all in her power to raise the money necessary to complete her ship-canal from the Alleghany River to Lake Erie; Cincinnati has received encouragement from the Federal government in her desire for a deep-water channel to Toledo, and surveys have been made; Chicago urges the completion of a twenty-two-foot channel to St. Louis, as well as a canal due west from the Chicago River to the Father of Waters; Wisconsin has projected a canal across the State, connecting Lake Michigan with the Mississippi; while Minneapolis and Duluth are rejoicing over the report of the Federal engineers as to the feasibility of a ship-canal between the two cities.

New York State has called in Federal aid and advice, besides sending its own representatives to Europe for the express purpose of studying the canal systems of the Old World. The com-

SAULT STE. MARIE CANAL—HEADQUARTERS

missioners discovered that in France, along 485 miles of canals and 741 miles of rivers is transported one-third as much freight as over the railways. In Germany the conditions were the same, except that the traffic on the inland waterways was increasing much more rapidly than that of the railways. Russia, however, is the one country of the world that sets a glowing example in the economy of inland waterways. Her 34,000 miles of navigable rivers and canals carry the preponderance of her freight traffic, and the government still pursues the policy of making vast appropriations for building new canals, as well as for extending the railway systems. With a sum of money not greater in amount than our annual appropriation for pensions, Russia may construct a ship-canal twenty-nine feet deep from Riga and St. Petersburg on the Baltic, to Odessa on the Black Sea. Through this inland waterway the largest war-ships in the navy would be able to steam at the rate of eight miles an hour. The same appropriation is to complete this canal from the Neva to the North Sea, so that steamboats can be run in summer from St. Petersburg or Moscow thousands of miles into Siberia, ascending the Yenissei River even to Lake Baikal.

Further still, the surplus of this appropriation is to be used for the construction of a ship-canal between the Black and Caspian seas; and next would be tackled the problem of diverting the waters of the Oxus back to its old course, so that it will again flow into the Caspian. With these two projects accomplished, the steamers that now navigate this mighty Asiatic stream—from the Sea of Aral almost to the gates of Herat, in Afghanistan—will be able to proceed with heavy cargoes into the heart of Europe.

At present America has but 18,566 miles of navigable rivers and canals; yet the marvellous possibilities of Russian inland navigation can in many respects be excelled by those of America. With an expenditure equal in amount to the appropriation for pensions by a single Congress (nearly $300,000,000 for the two years), it has been estimated that an inland coast waterway could be made navigable for large steamers from Providence Inlet, Rhode Island, to Galveston, Texas, and the Rio Grande, on the boundary-line between the United States and Mexico. A natural waterway for almost the entire distance already exists. To perfect the route, but comparatively little work is necessary.

In fact, even now, modern torpedo-boats can pass from Narragansett Bay to a point one hundred miles south of Cape Hatteras without being compelled to

leave the inland passage at all. In April, 1900, a bill was introduced in Congress to provide for the construction of a ship-canal, 19 miles long, from Boston Harbor to Taunton River and Narragansett Bay; and another to build a free ship-canal, 30 feet deep and 13 miles long, across Maryland and Virginia, in order to connect the waters of the Chesapeake to those of the Delaware. The work to deepen the existing canal across New Jersey is not abandoned by any means; so that, as a matter of fact, practically the only extensive work that remains to be accomplished is through the Dismal Swamp. An extension made of the sound channels to Wilmington, a cut-off dug through the lowlands of North Carolina from the Cape Fear River to the Waccamaw, and the much-talked-of ship-canal across Florida from the St. Johns River by way of the Suwanee River would have to be built. Then several Louisiana swamps and bayous need to be dredged, and the coast of Texas would be reached. There are two breaks in the inlet system along the Texas coast which would have to be canalled in order to complete the system of inland coast waterway from Massachusetts to the Rio Grande, and up that river for many hundred miles to El Presidio. The remarkable increase of steamboat and barge traffic of late years through existing inland waterways from Fall River to the sounds of North Carolina is bringing nearer every day the construction of the missing water links that will make one continuous river along our Atlantic and Gulf seaboards. From Philadelphia to Galveston not a lock would be necessary, unless, perhaps, on the canal through Florida. There are no great engineering difficulties to be overcome, and the work already accomplished on Southern coast canals indicates that the completion of such a series of waterways could be accomplished at a minimum cost. In fact, the government is even now connecting by canals the various inlets on the South Carolina, Georgia, and Gulf coasts, as the traffic through some of these waterways has increased tenfold in the last decade. Across Florida, by way of the St. Johns River, Lakes Kissimmee and Okechobee, a steamboat canal is now in course of construction, while the inlets of Mississippi and Louisiana are being connected, and Houston, Texas, with the sounds that run from Galveston to the vicinity of Tampico, Mexico. The completion of such a system would still leave something over two-thirds of the appropriations we are supposed to be utilizing for other canals.

WELLAND CANAL (OLD)

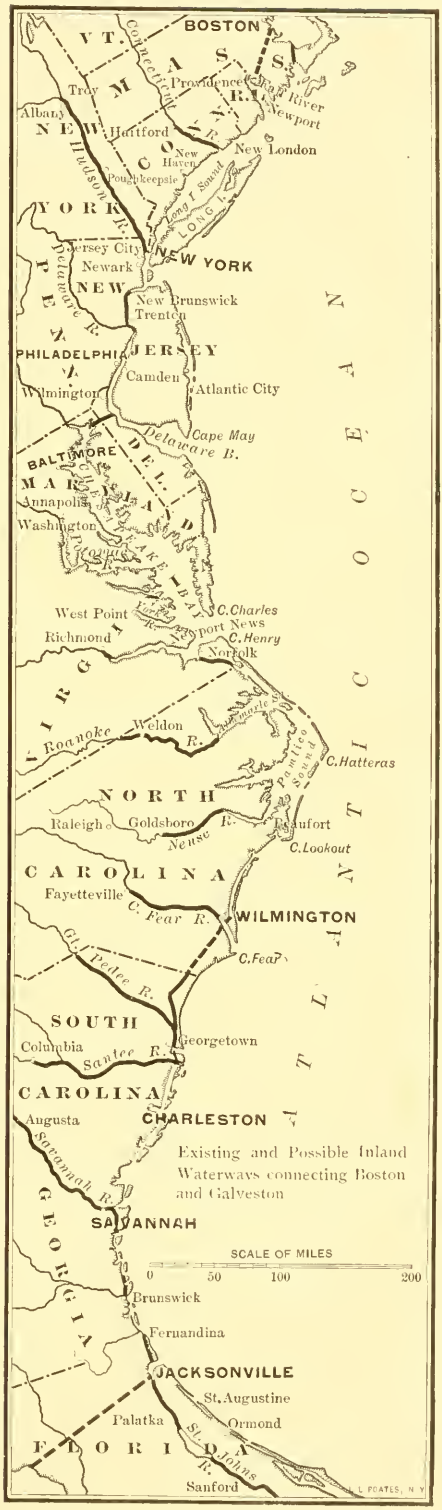
The sum of $200,000,000, it has been estimated by Federal government engineers, would complete a fifteen-foot channel between New York city and Duluth, *viâ* the enlarged Erie Canal; build the proposed ship-canals from Pittsburg to Ashtabula, Cincinnati to Toledo, Chicago to the Mississippi, and the Duluth-Minneapolis Canal from the head of the greatest of our lakes to the navigable channel of the Father of Waters; with possibly enough left over to continue our inland waterway to the navigable head of the Red River of the North, thus opening up to steamboat traffic vast sections of the Northwest, and connecting Winnipeg Lake and Hudson Bay with the Gulf of Mexico and the Atlantic Ocean.

From the terminus of such a proposed canal, at the Red River of the North, in Dakota, it would be less than two hundred miles due west, over a level prairie diversified by lakes and rivers, to the upper Missouri. If such a route is practicable, the people of Montana, the Dakotas, and Wyoming will doubtless agitate until a canal connection is made, as it would, with the other suggested waterways completed, bring Fort Benton, at the foot of the Rockies, in direct steamboat and barge connection with the Hudson River, nearly three thousand miles away.

The government is spending large sums of money to make the Columbia River navigable from the Pacific Ocean to Lake Pend d'Oreille, in northern Idaho; and when this is accomplished, a distance not much greater than the length of the proposed Nicaragua Canal will separate the heads of navigation of the two great rivers, the Columbia and the Missouri, with the possibility that when the Missoula River and Lake Flathead, in Montana, are surveyed and improved, the distance will be lessened by another hundred miles or more.

Perhaps some inspired latter-day Washington is even now riding his horse along the banks of the Kootenai, dreaming of a canal through the valleys of the Rocky Mountains which will connect the waters of the Atlantic and the Pacific, and looking upon the great lakes in these mountains as heaven-born feeders of his colossal project of an all-American interoceanic canal. He might even reason that the 1500 feet to be ascended by lockage in the 100 miles from Fort Benton to the summit-level is no greater an engineering problem than the lift of 200 feet in five miles on the Erie Canal, or the elevation of the Black River Canal summit in New York 1100 feet above the Hudson. If such a dreaming genius is to-day wandering through these mountains with his chain and sextant, doubtless another Ericsson is somewhere perfecting machinery that will eventually make possible the plans of the dreamer.

In Canada the Dominion government has already spent twelve dollars per capita on inland waterways to our paltry fifteen cents a head for deep-water canals. It is the ceaseless energy of Canada in



building ship-canal after ship-canal, to divert the commerce of the lakes to her own territory, that has at last aroused our government to action.

Since the civil war the Canadian government had appropriated many millions of dollars to complete a fourteen-foot channel from Montreal, *viâ* the St. Lawrence River and the lakes, to Duluth. Last year the *Puerto Rico,* a steamship 250 feet in length, built in Toledo, carried her cargo *viâ* the St. Lawrence River and the Atlantic coast to New York; and this spring the Soulanges Canal was opened for traffic, thus completing a fourteen-foot channel to the ocean. Immediately Chicago and other Western capitalists invested their money in the erection of elevators at Montreal, in which to store the 35,000,000 bushels of wheat they expect the new route to divert from New York the first season.

Notwithstanding the fact that, after all her vast expenditure of treasure, the tonnage of Canadian vessels on the lakes amounted last year to but eleven per cent. of the whole, yet the undaunted Dominion contemplates spending an additional thirty million dollars to build the Montreal, Ottawa, and Georgian Bay Canal. When completed, this will bring Duluth and Chicago five hundred miles nearer to Montreal, and give the ships of those cities a direct air-line route to Liverpool, one thousand miles shorter than *viâ* New York. Nor is this the only great canal project in Canada threatening American commercial interests and the supremacy of New York's Western traffic. The Trent Canal, connecting Georgian Bay and Lake Ontario, is to be built, while the Lake Huron-Toronto project is still being agitated.

The government at Washington appointed a commissioner to ascertain the most feasible route for an American ship-canal from the Great Lakes to the Atlantic, and three routes were reported on.

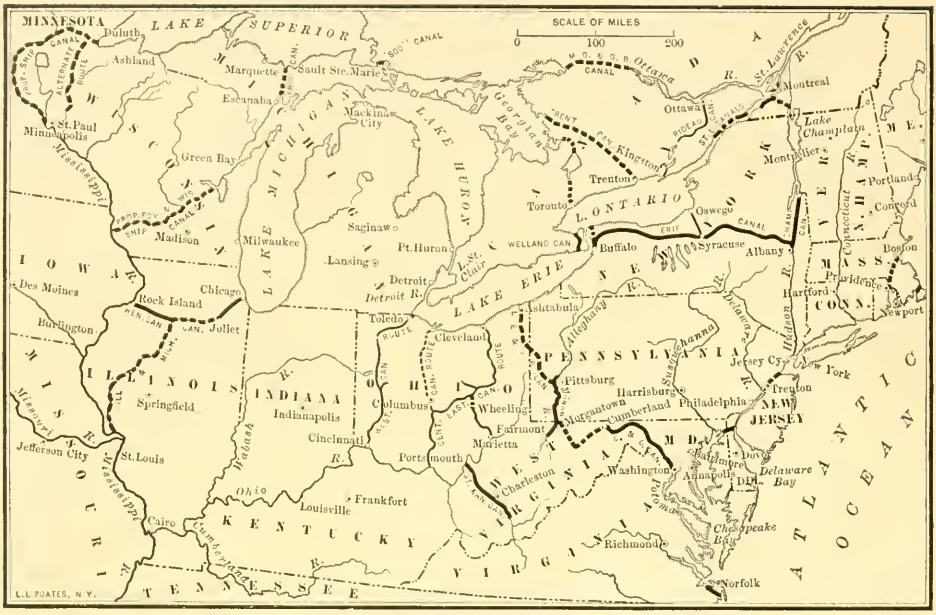
The Niagara Falls Canal and Oswego route was the one advocated, although the advantages of the all-American inland canal from Buffalo were dwelt upon, and the estimated cost would be from a hundred and twenty-five millions to a quarter of a billion dollars. The larger estimate would allow for a depth of twenty-eight feet from Lake Erie to the Battery, New York, and the estimated traffic passing through the canal proper would be 24,000,000 tons a year. The saving on freight rates was estimated at $9,000,000 per annum. At present less than 3,000,000 tons of freight are carried on the Erie Canal during the 245 days that it is operated—a great falling off, due largely to an absurd law still in force which forbids any corporation with a capitalization of over $50,000 doing business on the waters of the canal. Recently a Cleveland company constructed a number of steel barges especially suited for canal traffic, but they were turned back at Buffalo when it was learned that the company operating them was capitalized for a larger amount.

The Erie Canal has made New York the richest State in the Union, despite the superior mineral and other advantages of Pennsylvania. Along the Erie Canal and its branches have sprung up all of New York's great cities, and ninety per cent. of the taxes in the State are paid by the regions penetrated by the canals and their outlet, the Hudson River. The railroads have followed the canals, and the only four-tracked railroad in the world to-day parallels the Erie Canal.

The building of a ship-canal two miles long doubled, trebled, and quadrupled the traffic of the Great Lakes almost within a single decade, and sent steel rails flashing across the prairies westward from Lake Superior in every direction to gather traffic made lucrative by the improved waterway. Through the "Soo" Canal, connecting Lakes Superior and Huron, now deepened to twenty-two feet, pass yearly, during the seven or eight months of navigation, over 20,000,000 tons of freight. This is one-third of the total traffic of the Great Lakes, and nearly thrice as great as the tonnage passing through the Suez Canal. Only two per cent. of this is claimed by Canada, although opposite the American canal at Sioux City there are massive locks belonging to the Dominion.

To form an idea of the tonnage now carried on the lakes, fix in your mind that the average trip of a lake freighter is something over eight hundred miles, which must multiply the 60,000,000 tons which are loaded and unloaded at lake

EXISTING AND PROPOSED INLAND WATERWAYS THROUGHOUT THE UNITED STATES



PRINCIPAL CANAL REGION OF THE UNITED STATES

ports, so that the ton-miles of freight carried equals forty per cent. of the amount of ton-miles of freight carried on all the railroads of the United States during the entire year. Full cargoes of iron ore can be loaded on 7000-ton freighters at Duluth in less than three hours, and the cost for laying down the same at Buffalo is sixty cents per ton. The rate on wheat is two cents a bushel; copper ore, $2 per ton, and twenty-five cents a ton for coal. No railroad can compete with these rates, so the railroads have taken to the lakes, and the most magnificent boats on those waters are operated by the railroads.

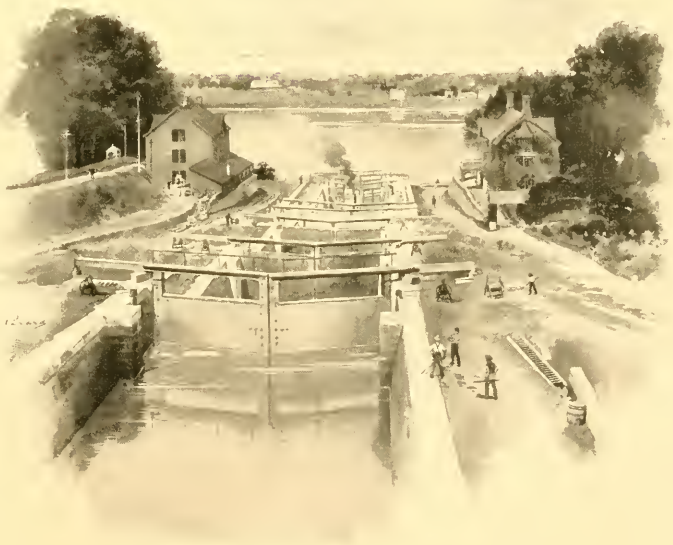
Pittsburg has had numerous surveys made, and is now getting ready to construct a thirty-three-million dollar waterway, sixteen feet in depth, from the junction of the Alleghany and Monongahela rivers to Lake Erie at Ashtabula. Lake steamers laden with coal will sail for Duluth, and Pittsburg hopes to become the terminus of the copper and iron ore traffic of Minnesota. The energy of Pittsburg is remarkable. Southward she has made a waterway navigable for her steamers to the heart of West Virginia by utilizing the Monongahela River; so that to-day George Washington's original route for a waterway across the Alleghanies lacks but a hundred miles of completion. When Pittsburg has built a ship-canal to the lakes, the city will doubtless turn longing eyes toward Chesapeake Bay, and lay plans to become a seaport as well as a lake port, besides being, as at present, the greatest river shipper of New Orleans and the Gulf of Mexico.

Chicago, with her accustomed independence, also has displayed great enterprise. After memorializing Congress in vain, she set to work and, at a cost of $33,000,000, constructed forty miles of the greatest ship-canal in the world. She pauses at present to catch her second breath, and observe whether the government will continue the twenty-two-foot channel to St. Louis. Chicago's first memorial to Congress for the construction of the Hennepin Canal, from Chicago westward across the State to the Mississippi, is unique. It began by reminding our statesmen that while they had appropriated four billion dollars and sacrificed 600,000 lives to hold several States in the Union, they begrudged the few million dollars necessary to bind the reunited States together by a system of waterways that forever would make them

one commercially. The memorial concluded by quoting the following words of John C. Calhoun: "Let us bind the republic together. Let us conquer space by a perfect system of roads and canals." The government is now at work on this canal.

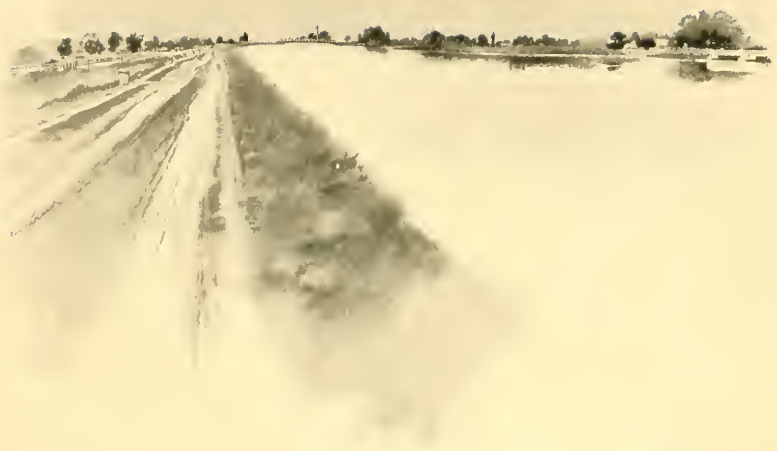
Wisconsin has not been so fortunate in securing government aid for her trans-State ship-canal from Green Bay to the Mississippi River. Minneapolis and Duluth, however, induced Congress to order complete surveys of all possible canal routes between the two cities, two of which have already been reported upon as feasible. The completion of either would bring lake traffic within 100 miles of the Red River of the North, and a canal a hundred miles shorter than the Erie, crossing the Red River, would connect the upper Mississippi and Missouri.

The Canadian Minister of Canals reports that, when the growth of population in the Northwest warrants the expenditure, a ship-canal will connect Winnipeg with the Great Lakes and the Atlantic Ocean, while the tributaries of Lake Winnipeg will be made navigable to the Rocky Mountains. Our upper Missouri River when canalized will parallel the proposed Canadian system. The melting snows of the mountains of Montana would provide a vast amount of water to be stored up every spring for summer use to float the grain of the country to the seaboard. Along such a river and canal route towns would necessarily spring up, the wonderful surplus water-power of Great Falls would no longer go to waste, and freight rates would be affected from Puget Sound to the Hudson River. Just as the Erie Canal has continually lowered the tariff on every railroad from New York to Minnesota, besides saving $200,000,000 on grain freights from the West, in the last thirty years, so would the perfection of a continued Western waterway develop the Far West, as inland navigation has built up the East. Oil from Wyoming could be profitably shipped to the East and compete with the Ohio product. A new wheat country would be developed, and the immense cattle-ranches of Montana would quadruple in value if the armies of steers could be rounded up at the water-side and driven aboard steamers for the East. It must not be forgotten that the new Erie Canal—with a depth of not more than eleven feet—will, according to the Federal engineers, lower the freight rate on grain from Duluth to New York city by fully one cent a bushel, saving consumers and shippers about $9,000,000 a year.



RIDEAU CANAL, CANADA

What mind can conceive the miracles which would be wrought if America should spend on inland ship-canals an amount per capita equal to that which has already been expended by the Canadian government? The sum total would



WELLAND CANAL (NEW)

run well up toward a billion of dollars, and would make our country resemble a map of Mars. Major Symons, of the United States Engineer Corps, reports that steam-barges with a carrying capacity of 1500 tons can navigate safely with a depth of ten feet of water. It is such a channel he advocates across New York, at a cost of perhaps one-third that of a ship-canal. Montreal is preparing to run through her new canals a line of lake and river cattle-steamers to carry live-stock from Chicago to Montreal in four days, but little more than the schedule time of a fast freight train. Whaleback steamers carrying 4000 tons of freight need draw but fourteen feet of water—the minimum depth of the Canada canals, which at a cost of $120,000,000 it is now proposed to deepen to eighteen feet. The indomitable courage of the Canadians' fight for lake supremacy is beginning to reap its reward. Canada's canals can now compete with the railways, and even compel the building of other lines to carry overland the commerce developed by the canals. In the United States, however, the canals of 1825 still have to compete with the railroad train of 1900. The present Erie Canal barge accommodates a capacity equal to that of an early freight train—about 240 tons; but had the recent improvements, costing $9,000,000, proved successful, 400-ton barges would be able to navigate the canal freely.

Our wealthiest railroad systems lie between the Atlantic and the Great Lakes. They parallel every navigable stream from Maine to Illinois. Waterways tend to build up towns and cities, the railways profiting thereby. As in Europe, where the railroads and canals are equally fostered, so it should be in America. Along every ship-canal great manufacturing plants would of necessity spring up, certain freights would go back and forth by the water route, but as the tributary country is developed, the railroads would reap by far the richer benefits. Of freight shipped from the lakes *viâ* a ship-canal, a very small percentage, it is proved by experience, would ever reach the coast; all along the route it would be distributed to interior towns, reached only by the freight train; so that the development of a deep-water canal system cannot but prove beneficial to the immense railroad interests of America, which, in the opinion of many, should be the first to welcome the new era of inland waterways.

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